

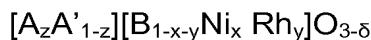
### Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Claims 1 – 17 (cancelled)

Claim 18 (currently amended): ~~The composition according to Claim 16, A catalytic composition for partial oxidation of light hydrocarbon mixtures, comprising:~~

~~wherein said a perovskite crystallographic structure further comprises comprising a formula (I):~~



wherein said A and said A' each comprise at least one component selected from the group consisting of the lanthanide lanthanide family, the actinide family, and group IIa,

wherein said B is at least one component selected from the transition metal groups of columns Ib, IIB, IIIb, IVb, Vb, VIb, VIIb, and VIIIb,

wherein  $0 < x \leq 0.7$ ,

wherein  $0 < y \leq 0.5$ ,

wherein  $0 < x+y \leq 0.8$ ,

wherein  $0 \leq z \leq 1$ , and

wherein said  $\delta$  is adjusted so as to obtain ~~the~~ an electric neutrality of said perovskite compound.

Claim 19 (previously presented): The composition according to Claim 18, wherein said A and said A' each comprise at least one component selected from the group consisting of:

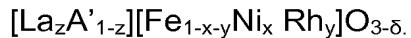
- i) La;
- ii) Ce;
- iii) Ca; and
- iv) Sr.

Claim 20 (previously presented): The composition according to Claim 19, wherein said A is La.

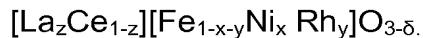
Claim 21 (previously presented): The composition according to Claim 18, wherein said B is at least one component selected from the group consisting of:

- i) Mn;
- ii) Fe;
- iii) Co; and
- iv) Al.

Claim 22 (currently amended): The composition according to Claim 18, wherein said perovskite crystallographic structure further comprises formula (Ia):



Claim 23 (currently amended): The composition according to Claim 18, wherein said perovskite crystallographic structure further comprises formula (Ib):



Claim 24 (previously presented): The composition according to Claim 18, wherein  $0 < x \leq 0.5$ .

Claim 25 (previously presented): The composition according to Claim 18, wherein  $0 < y \leq 0.25$ .

Claim 26 (previously presented): The composition according to Claim 18, wherein  $z < 1$ .

Claim 27 (currently amended): The composition according to Claim 22, wherein said formula (Ia) comprises about  $\text{La Fe}_{0.7}\text{ Ni}_{0.25}\text{ Rh}_{0.05}\text{ O}_{3-\delta}$ .

Claim 28 (currently amended): The composition according to Claim 23, wherein said formula (Ib) comprises ~~about~~  $\text{La}_{0.8} \text{Ce}_{0.2} \text{Fe}_{0.7} \text{Ni}_{0.25} \text{Rh}_{0.05} \text{O}_{3-\delta}$ .

Claim 29 (cancelled)

Claim 30 (currently amended): The composition according to Claim [[16]] 18, wherein said partial oxidation of light hydrocarbon mixtures occurs when an operating temperature of the catalyst is in the range of about 500 to about 1300 °C.

Claim 31 (previously presented): The composition according to Claim 30, wherein said operating temperature of the catalyst is in the range of about 600 to about 1100 °C.

Claim 32 (currently amended): The composition according to Claim [[16]] 18, wherein said partial oxidation of light hydrocarbon mixtures occurs when an operating pressure of the catalyst is in the range of about  $10^5$  Pa to about  $3 \times 10^6$  Pa.

Claim 33 (previously presented): The composition according to Claim 32, wherein said operating pressure of the catalyst is in the range of about  $10^5$  Pa to about  $10^6$  Pa.

Claim 34 (currently amended): The composition according to Claim [[16]] 18, wherein said partial oxidation ~~further comprises of light hydrocarbon mixtures occurs when~~ at least one oxidant gaseous feed ~~is combined with said light hydrocarbon mixtures, and wherein said oxidant gaseous feed is at least one selected from the group consisting of:~~

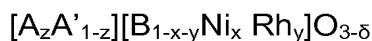
- i) oxygen;
- ii) oxygen and an inert gas mixture; and
- iii) steam and carbon dioxide.

Claim 35 (currently amended): The composition according to Claim [[16]] 18, wherein said light hydrocarbon mixture to be partially oxidized further comprises natural gas.

Claim 36-38 (cancelled)

Claim 39 (currently amended): ~~The method according to Claim 37, A method for making a catalytic composition for the partial oxidation of light hydrocarbon mixtures, comprising:~~

~~preparing an aqueous solution comprising a salt comprising A, a salt comprising A', a salt comprising B, a salt comprising Ni, and a salt comprising Rh;~~  
~~combining said aqueous solution with an acid;~~  
~~evaporating said aqueous solution to form a sol;~~  
~~drying said sol to form a wherein said perovskite crystallographic structure further comprises comprising formula (I):~~



wherein said A and said A' each comprise at least one component selected from the group consisting of the lanthanide lanthanide family, the actinide family, and group IIa,

wherein said B is at least one component selected from the transition metal groups Ib, IIB, IIIb, IVb, Vb, VIb, VIIb, and VIIIb,

wherein  $0 < x \leq 0.7$ ,

wherein  $0 < y \leq 0.5$ ,

wherein  $0 < x+y \leq 0.8$ ,

wherein  $0 \leq z \leq 1$ , and

wherein said  $\delta$  is adjusted so as to obtain [[the]] an electric neutrality of said perovskite compound.

Claim 40 (previously presented): The method according to Claim 39, wherein said A and said A' each comprise at least one component selected from the group consisting of:

- i) La;

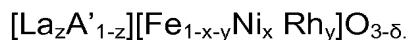
- ii) Ce;
- iii) Ca; and
- iv) Sr.

Claim 41 (previously presented): The method according to Claim 40, wherein said A is La.

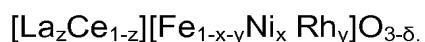
Claim 42 (previously presented): The method according to Claim 39, wherein said B is at least one component selected from the group consisting of:

- i) Mn;
- ii) Fe;
- iii) Co; and
- iv) Al.

Claim 43 (currently amended): The method according to Claim 39, wherein said perovskite crystallographic structure ~~further~~ comprises formula (Ia):



Claim 44 (currently amended): The method according to Claim 39, wherein said perovskite crystallographic structure ~~further~~ comprises formula (Ib):



Claim 45 (previously presented): The method according to Claim 39, wherein  $0 < x \leq 0.5$ .

Claim 46 (previously presented): The method according to Claim 39, wherein  $0 < y \leq 0.25$ .

Claim 47 (previously presented): The method according to Claim 39, wherein  $z < 1$ .

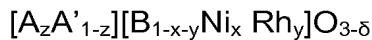
Claim 48 (currently amended): The method according to Claim 43, ~~further comprising about wherein said perovskite crystallographic structure comprises~~ La Fe<sub>0.7</sub> Ni<sub>0.25</sub> Rh<sub>0.05</sub> O<sub>3-δ</sub>.

Claim 49 (currently amended): The method according to Claim 44, ~~further comprising about wherein said perovskite crystallographic structure comprises~~ La<sub>0.8</sub> Ce<sub>0.2</sub> Fe<sub>0.7</sub> Ni<sub>0.25</sub> Rh<sub>0.05</sub> O<sub>3-δ</sub>.

Claim 50-56 (cancelled)

Claim 57 (new) A method for the partial oxidation of light hydrocarbon mixtures, comprising:

providing a feed comprising said light hydrocarbon mixtures; and  
contacting said feed with a catalyst comprising a perovskite crystallographic structure comprising formula (I):



wherein said A and said A' each comprise at least one component selected from the group consisting of the lanthanide family, the actinide family, and group IIa,

wherein said B is at least one component selected from the transition metal groups Ib, IIb, IIIb, IVb, Vb, VIb, VIIb, and VIIIb,

wherein  $0 < x \leq 0.7$ ,

wherein  $0 < y \leq 0.5$ ,

wherein  $0 < x+y \leq 0.8$ ,

wherein  $0 \leq z \leq 1$ , and

wherein said  $\delta$  is adjusted so as to obtain an electric neutrality of said perovskite compound.

Claim 58 (new): The method according to Claim 57, further comprising maintaining said catalyst at a temperature between about 500°C and about 1300°C.

Claim 59 (new): The method according to Claim 58, wherein said temperature is between about 600° and about 1100° C.

Claim 60 (new): The method according to Claim 57, wherein said method is carried out under a pressure between about  $10^5$  Pa and about  $3 \times 10^6$  Pa.

Claim 61 (new): The method according to Claim 60, wherein said pressure is between about  $10^5$  Pa and about  $10^6$  Pa.

Claim 62 (new): The method according to Claim 57, wherein said feed further comprises an oxidant comprising at least one of:

- i) oxygen;
- ii) oxygen and an inert gas mixture; and
- iii) steam and carbon dioxide.